



KNOWING WHO KNOWS WHAT BEST: PRESCHOOLERS SELECTIVELY USE OTHERS PAST ACCURACY IN CAUSAL AND VERBAL LEARNING

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ABSTRACT

This research examined the ability of three-and-four-year-olds to use domains of knowledge to evaluate sources of knowledge. Participants were presented with a causal expert who fixed broken toys and a verbal expert who knew the names of tools. Participants were then asked if they should ask the causal expert or verbal expert for assistance with two questions each concerning causal, verbal, and functional knowledge. Four-year-olds, but not three-year-olds, selected to ask the causal expert for causal knowledge and the verbal expert for verbal knowledge. In terms of functional knowledge, as a group participants did not prefer one expert over another. However, four-year-olds selected the same expert for both functional questions at a significant level, suggesting they had a firm decision about which expert was best suited to answer the functional questions. These results suggest four-year-olds are able to use domains of knowledge to evaluate the epistemic states of other people and have theories about how verbal, functional, and causal knowledge relate to one another.

BIOGRAPHICAL SKETCH

Christopher Vredenburg graduated from Springfield High School in 2001. He then graduated from Fordham University with a Bachelor's of Science with majors in Philosophy and Psychology.

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Introduction

Children do not raise themselves alone on isolated planets as self-declared princes or princesses. If they do, 20th century French literature suggests children's strong drive to socialize compels them to search distant planets for social companions (Saint-Exupéry, 1946/1999). More often, though, young children are raised in decidedly social contexts and other people serve as sources of knowledge for children to plunder with questions about the world. As we all know, even with the best of intentions sometimes people are uncertain or ignorant (Callanan, Sabbagh, Perez, & Cervantes 1995). Children are therefore obliged to develop a healthy sense of skepticism to filter reliable information from misinformation. In doing so, children's cognitive development and social development are intimately threaded together.

Recent research has illuminated several important aspects of how young children evaluate other people as sources of knowledge. At sixteen months, young children distinguish true from false assertions, attempt to correct people's false assertions, and are sensitive to other people's visual access to information (Koenig & Echols, 2003). Three-and-four-year-olds spontaneously keep track of a person's history of accuracy and four-year-olds use the history of accuracy to guide subsequent learning (Birch, Vauthier, and Bloom, 2008; Clément, Koenig & Harris, 2004). Children generally consider adults to be more knowledgeable than children (Taylor, Cartwright, & Bowden, 1991), but three-and-four-year-olds prefer to learn from an accurate child instead of an adult who has mislabeled familiar objects (Jaswal & Neely, 2006). Additionally, four-year-olds notice when people express certainty or uncertainty and they learn better from people who are certain (Sabbagh & Baldwin, 2001). Lastly, three-and-four-year-olds consider personal and situational constraints, such as people's ability to apply their knowledge to the question at hand, when

evaluating whether to trust the information people provide (Kushnir, Wellman, & Gelman, 2007).

While most of the studies listed above are limited to word learning, there is evidence that young children appreciate the significance of having expertise within a certain area of knowledge (Danovitch & Keil, F., 2004; Lutz, D. & Keil, F., 2002). According to Keil and colleagues (Lutz & Keil, 2002), society reflects the division of academic departments in so far as people become experts in areas such as biology and mechanics, forming society's "cognitive division of labor." Supporting this theory, four-and-five-year-olds referred to biological and mechanical principles to decide whether to ask a doctor or mechanic about various hypothetical questions (Lutz & Keil, 2002). This finding indicates that young children understand both the conceptual and social significance of domains of knowledge. Namely, people's knowledge is clustered in conceptually related areas, making them better sources of knowledge about topics related to their expertise, but less accurate about conceptually distant topics. However, this research does not indicate whether children can evaluate expertise in unfamiliar people by keeping track of a history of accuracy.

Thus far, there are a few studies that shed some light on how children may use domains of knowledge to evaluate people as sources of knowledge by referring to a history of accuracy (Birch, Vauthier & Bloom, 2008; Koenig & Harris, 2005; Sobel & Corriveau, in press). In one of these studies, both three-and-four-year-olds were presented with an accurate informant who correctly labeled familiar objects and an inaccurate informant who mislabeled those same objects (Koenig & Harris, 2005). In the test trial, both informants presented children with different labels for novel objects and functional knowledge concerning how to use novel objects. Children endorsed the accurate informant's labels and functional knowledge. This result suggests young children consider verbal knowledge to be predictive of functional knowledge, at least

when faced with accurate and inaccurate labelers. Since functions are also a sort of conventional knowledge, that is, knowledge generally shared by everyone in a society, relating verbal and functional knowledge is certainly not unreasonable (Liebal & Tomasello, 2009). Indeed, along with language, functional knowledge forms part of what has been termed shared knowledge, meaning that it is part of the “common conceptual ground” of society that underlies everyday communication and social activity (Liebal & Tomasello, 2009; Tomasello & Rakoczy, 2007). Therefore, someone who does not know the conventional labels for familiar objects may be less likely to know their normative uses. However, in the case of this study, it is possible that children referred to the experimenters' histories of accuracy, but children may not have considered the significance of the two knowledge domains. That is, children may have unwittingly endorsed the accurate informant based on the familiar label associations she made without considering how functional knowledge relates to verbal knowledge. Thus, these results are inconclusive for determining how children relate verbal knowledge and functional knowledge.

The second study addressed how causal knowledge relates to verbal knowledge. Three-and-four-year-olds were presented with someone who knew what was inside an object and another person who knew the color of a sticker on the back of the object (Sobel & Corriveau, in press). Thus, both people expressed knowledge of the object, but one knew about its internal properties and the other about a superficial external property. Four-year-olds, but not three-year-olds, endorsed the label of the person who knew the internal properties. Since young children associate internal parts with causal mechanisms (Gelman & Gottfried, 1996; Gelman & Wellman, 1991), this result suggests that four-year-olds consider causal knowledge to be more relevant than non-causal knowledge when considering the object's label. Indeed, someone who knows how an object's causal mechanism works demonstrates expertise, whereas

knowledge about its appearance indicates mere familiarity. While familiarity often suffices for verbal knowledge, it seems reasonable to expect that the causal expert might be a more reliable informant about that particular object's label. After all, an expert may know the entire range of verbal expressions for items in their field of expertise, in addition to their causal knowledge. However, it is not clear that the results of this study indicate a general association of causal knowledge and verbal knowledge. It is possible, and perhaps even likely, that the children's evaluations in this study regarded knowledge of that particular type of object's label and were not indicative of a general relation between causal knowledge and verbal knowledge. Assessing the latter would have required asking children about labels for different types of novel objects, not just the objects for which the causal expert knew the insides.

In sum, these studies suggest that children may consider domains of knowledge (e.g. words, functions, causal properties) when they evaluate how past accuracy generalizes to new situations. To conclusively test this idea, however, we need to answer two questions. The first is whether children can, from a few observations, discern expertise of different sorts (e.g. mechanical, verbal, etc.). in other words, by keeping track of a history of accuracy? While it is known that young children can identify conceptually related subjects when given a familiar occupational label (e.g. a mechanic), it is not known whether children can, from a few observations, induce someone's expertise. Therefore, the second research question concerns whether children can use a history of expertise to guide their predictions about which questions experts are best suited to answer.

We investigated these questions by developing two types of experts, a causal expert and a verbal expert. Three-and-four-year-olds were asked to select the appropriate expert for questions concerning three different domains of knowledge.

The causal expert demonstrated causal expertise by fixing two broken electronic toys, but did not know the names of two tools. Contrarily, the verbal expert established verbal expertise by specifying the names of the two tools, but was unable to fix the two broken electronic toys. To assess whether children keep track of histories of expertise, children were asked who fixed the toys and who knew the names of the tools. Children were then asked to help decide which expert's assistance they would request to answer questions concerning the labels of novel objects, the functional purposes of novel objects, and how to fix additional broken toys.

The design therefore evaluates whether young children can keep track of two histories of expertise and use them to appropriately guide requests for information. In this case, we hypothesized that four-year-olds would ask for causal information from the causal expert and verbal information from the verbal expert, thus expressing knowledge of the relevance of knowledge domains. Doing so would be a strong indication that children are sensitive to the difference of these types of knowledge and can use verbal and causal information to evaluate people as sources of knowledge. We hypothesized that three-year-olds would perform less well in this regard for two reasons. First, past research indicates that three-year-olds have difficulty distinguishing different types of knowledge (Lutz & Keil, 2002). Second, three-year-olds also have difficulty using information about other people's epistemic states in requesting information (Sabbagh & Baldwin, 2001). However, three-year-olds are able to properly encode information about an informant's history of accuracy, suggesting that memory deficiencies do not underlie the performance differences of three and four-year-olds (Clément, Koenig & Harris, 2004).

Regarding the second research question, that of whether children can use a history of expertise to guide requests for information, it was unclear whether children would prefer the verbal expert or the causal expert for the functional prediction

questions. That is, those questions designed to assess who knew the function of the toy. While children considered verbal knowledge to be predictive of functional knowledge in prior research (Birch, Vauthier, and Bloom, 2008; Koenig & Harris, 2005), we sought to assess two different perspectives of how functional knowledge relates to causal and verbal knowledge. According to the theory of shared knowledge (Liebal & Tomasello, 2008; Tomasello & Rakoczy, 2007), both functional and verbal knowledge are types of conventional knowledge shared by everyone in a society. This social aspect of functional knowledge suggests that possessing verbal knowledge should be a strong indicator of functional knowledge. Specifically, if a person is familiar with a society's verbal conventions, it is likely that they would also be familiar with the functional conventions. Causal knowledge, however, demonstrates expertise in a particular domain, in this case mechanical expertise, which is not a type of conventional knowledge widely shared by people. Thus, from this perspective, verbal knowledge should be a better predictor of functional knowledge than causal knowledge.

From another perspective, the mechanical expertise demonstrated by the causal expert is indicative of a strong understanding of how objects work to produce expected or desired effects. Functional knowledge consists of knowing how to manipulate the causal structure of an object in order to produce a certain effect. In this way, functional knowledge is indeed related to the causal structure of objects. Mechanics fix objects so that they may be used in the appropriate, normative ways. Thus, it could be argued that despite a lack of verbal knowledge, the causal expert would know more than the verbal expert about how novel objects should be used, either from experience or by analyzing the structural properties of the objects. In the current research, a forced choice between the verbal expert and the causal expert was implemented to analyze how young children conceive of functional knowledge.

Method

Participants

The participants were twenty-six preschoolers, 12 three-year-olds ($M= 3.67$, $SD= 0.28$) and 14 four-year-olds ($M= 4.53$, $SD= 0.24$) from the Ithaca, New York region. Children were recruited at local preschools. Equal numbers of girls and boys participated. All children spoke English, though some had bilingual backgrounds. The sample consisted mostly of children with middle to upper middle class Caucasian backgrounds, which is reflective of the surrounding region's demographics.

Materials

For the warm up trials, photographs of a banana, dog, and hammer were used to acclimate children to the testing procedure and experimenter. Throughout the familiarization phase and testing trials, children interacted with two hand puppets, one which resembled a monkey and the other a squirrel. They were aptly referred to as "Monkey" and "Squirrel," respectively. When Monkey and Squirrel were not involved in the interaction, they were positioned below the table.

Two electronic toys producing different light and sound effects served as the toys for Monkey and Squirrel to fix: an HSM microphone that produced a song and a hand-held 20 Questions toy that lit up and produced sounds (see the Appendix for photos of the stimuli). Both toys could be turned off, which enabled the experimenter to feign that they were broken. A standard Phillips screwdriver and wrench served as the tools used to "fix" the toys.

Various uncommon items were used for the prediction trials. A green avocado peeler and a metal tea diffuser served as unfamiliar tools for the labeling test trial questions. An unconventional dish scrubber and a black electronic box were used as the unfamiliar items for the function test trial questions. Two more hand-held

electronic toys were presented as broken toys for the causal test trial questions.

Design and Procedure

Warm Up Trials. Each child was interviewed at a small table opposite the experimenter in a quiet testing room at their preschool. Three photographs (a hammer, dog, and banana) were placed in front of children, one by one. For each photograph, the experimenter asked the child to identify the object. The experimenter congratulated and thanked children for their responses. All of the children knew the names of the depicted items.

Familiarization Phase. After the warm up trials, children were introduced to the experimenter's two friends, Monkey and Squirrel, who, children were told, “know a lot about stuff.” The experimenter explained that he had some broken toys that needed to be fixed, by saying, “Here's the first broken toy. And here's a tool that might help me fix it.” A screwdriver was the first tool and a wrench was the second. The experimenter asked the child if they knew what the screwdriver was called. If they did not know, the experimenter told them the name and the child repeated it.

Half of the children saw Monkey as the causal expert who fixed the toys; the other half saw Squirrel. Here is an example of a familiarization phase with Monkey as the verbal expert and Squirrel as the causal expert. The experimenter suggested they could ask Monkey for help, saying, “Let’s ask Monkey if he can help. Hey Monkey. Can you fix this toy?” Monkey referred to the screwdriver by name three times as a demonstration of his verbal knowledge. Monkey also tried to fix the toy by inserting the screwdriver into the screw holes of the microphone. The experimenter picked up the toy and said to the child, “All right, let's try it.” The experimenter pressed one of the buttons a few times, but since the toy was turned off, it did not work. The experimenter lamented, “Oh no! It's still broken. Thanks, Monkey.”

The experimenter then asked Squirrel to help. Squirrel agreed to try, but was ignorant of what the screwdriver was called, saying, “Can I use that thing? I don't know what it's called.” Squirrel indicated ignorance of the screwdriver's name three times. Squirrel spent approximately the same amount of time as Monkey fixing the toy. When Squirrel was finished, the experimenter surreptitiously turned on the toy and pressed a button, causing it to produce a sound. The experimenter commented, “Hey it works! Thanks, Squirrel.” In this way, Squirrel demonstrated strong causal knowledge.

The same procedure and pattern of results followed with the second toy and the wrench. Specifically, Monkey knew the tool's name, but was unable to fix the toy. Contrarily, Squirrel did not know the tool's name, but was able to use it to fix the toy. For each child, the first friend always knew the names of the tools and the second friend always properly fixed the toys. After the familiarization phase, the child was presented with the judgment trials and prediction trials.

Judgment Trials. After both of the toys were fixed, the experimenter told the child, “I'm so glad my toys are fixed. I'm going to leave these toys and tools right here [the causal expert was placed next to the tools and the label expert next to the toys]. Before we do anything else, can you tell me who fixed the toys?” If the child did not respond, they were asked if it was Monkey or Squirrel. The experimenter then asked the child who knew the names of the tools. The order of the two judgment questions was counterbalanced, as were the sides on which the toys and tools were placed. Any incorrect responses were appropriately corrected and children were congratulated for their responses. Following the judgment trials, the child was asked six predictive questions, two for each type of question: causal, functional, and labeling.

Prediction Trials. The experimenter told the child that he had some more things to show her that the experimenter does not know much about. It was suggested that Monkey and Squirrel might know about these things, and that the child could help decide which of the friends to ask for help. Six objects were presented to the child one at a time; the order in which they were presented was counterbalanced using a Latin square design. One third of the children were first presented with a function question, one third with a label question, and one third with a causal question. Children were shown the novel object and the experimenter told the child whether they wanted to know the object's label, what the object is for, or to fix the object. The experimenter then asked which friend they should ask for help. For example, for a label question, the experimenter said, "Now I have this thing [showing the child a tea diffuser or avocado peeler]. I don't know what it is called. I really want to know what it is called. Which friend should we ask?" If the child did not respond, or said both friends, the experimenter repeated the information and the child was asked to choose either Squirrel or Monkey. For the functional questions, the experimenter said they needed to know what the object was for, and for the causal questions that they needed to fix the object.

Results

The proportion of children who correctly answered the judgment questions, about 69%, was significant, $t(26) = 1.71$, $p < .05$. This suggests young children can keep track of two basic histories of expertise. Of the eight children ($M = 3.9$ years; 5 three-year-olds, 3 four-year-olds) who incorrectly answered the judgment questions, seven did not know which informant knew the names of the tools. Interestingly, all but one of these children did not know the names of the tools themselves. Thus,

perhaps these children simply did not comprehend the verbal expert's use of the tool names or could not properly evaluate the causal expert's lack of verbal knowledge. Unsurprisingly, these children were less likely to ask the verbal expert for labeling questions than children who correctly answered the labeling judgment question.

In terms of the prediction trials, item analyses via an Analysis of Variance revealed that children's responses for the two labeling questions, two function questions, and two causal questions did not differ from one another, as no significant effects were found. Thus, the children's responses did not differ based upon any of the specific stimuli used for the prediction questions. We next analyzed whether children's responses depended on the order in which the questions were asked, but no significant effects were found. Thus, results were collapsed across condition for analysis.

Including all of the children, we examined the proportion of children who selected the causal expert for the two causal questions, and the verbal expert for the two labeling and two functional questions. An analysis by age revealed that four-year-olds were significantly more likely than 3 year olds to select the causal expert for the causal questions, $\chi(df, N = 26) = 4.08, p < .04$, but similar tests for the labeling and functional questions were not significant. Overall, children were more likely to select the causal expert for the causal questions, $z = 2.40, p < .025$, but were not significantly more likely to select the verbal expert for functional questions, $z = .625, p < .27$, or labeling questions, $z = .875, p < .17$.

Analyses by age revealed that four-year-olds were more selective in their responses than three-year-olds. Four-year-olds did not perform differently from chance on the two functional questions, but they demonstrated a significant preference for the verbal expert on the labeling questions $z = 2.00, p < .05$, and for the causal expert on the causal questions, $z = 2.16, p < .05$. Three-year-olds, however, did not

perform differently from chance on any of the prediction questions.

We also examined the responses for the eighteen children ($M = 4.22$, $SD = .52$) who correctly answered both of the judgment questions. For the children who responded correctly to the judgment questions, age was not a significant predictor of their performance on the labeling, causal, or functional questions, though this may be due to the relatively low variance in age (Variance = .27). Children who correctly responded to the judgment questions were significantly more likely to select the causal expert for the causal questions, χ (df, $N = 18$) = 4.01, $p < .04$, and, at a marginal level of significance, were more likely to select the verbal expert for verbal questions, χ (df, $N = 18$) = 2.79, $p < .09$. These children were not significantly more likely to select the verbal expert for functional questions, χ (df, $N = 18$) = 1.51, $p < .22$.

Regarding the functional prediction questions, we performed some further analyses concerning the consistency with which children selected one of the informants on both functional prediction trials. Overall, the proportion of children who selected a single informant for both functional prediction trials was marginally significant, $z = 1.26$, $p < .10$. This effect was amplified for four-year-olds, $z = 5.92$, $p < .001$, but was only marginally significant for three-year-olds, $z = 1.30$, $p < .10$.

Discussion

Children watched two events in which one of the informants demonstrated stronger verbal knowledge and the other demonstrated stronger causal knowledge. Most of the children, including the majority of three-year-olds and four-year-olds, correctly responded to the judgment questions, indicating that they were able to keep track of two basic histories of expertise.

While the majority of three-year-olds were able to accurately answer the

judgment questions, they did not use this information to guide their subsequent requests for assistance. This result was expected and confirms the results of past research suggesting that three-year-olds have difficulty using information about other people's epistemic states to guide their requests for information (Sabbagh & Baldwin, 2001). It is also consistent with research indicating that three-year-olds have difficulty distinguishing the significance of knowledge domains (Lutz & Keil, 2002). Thus, there is more than one known reason indicating why three-year-olds would have difficulty with this task. Since the three-year-olds adequately encoded and recalled the events of the demonstration, it seems unlikely that the difficulty concerns information processing.

Identifying ways in which three-year-olds are able to use information they encode about epistemic states may help specify which aspect(s) of the process inhibits their performance. For instance, rather than assessing three-year-olds' predictions about epistemic states, investigating their explanations from a post hoc viewpoint may provide additional information. Indeed, prior research has indicated that it is often easier children for three-year-olds to provide explanations than predictions (Wellman, in press). Additionally, asking three-year-olds for explanations about why they select specific informants can provide more information about their decisions and comprehension of epistemic states. In sum, delineating the performance transition that children generally undergo from three to four in evaluating people's epistemic states remains a central issue for source monitoring research.

The performance of four-year-olds differed markedly from that of three-year-olds. With a relatively small amount of evidence, four-year-olds appropriately guided their requests for assistance, preferring the verbal expert for verbal knowledge and the causal expert for causal knowledge. Four-year-olds encoded the relevant evidence of knowledge domains from observation, identified the domain of knowledge implicated

by the questions, and correctly matched the questions with the appropriate informant. Overall, children differentially preferred the verbal expert and the causal expert depending on the type of assistance needed. Therefore, these results offer firm evidence indicating that four-year-olds can use information about knowledge domains to evaluate people as sources of knowledge.

This research represents an important extension of previous research concerning children's understanding and use of domains of knowledge. These results record an incipient ability to appreciate the significance of different types of knowledge. Although it may be argued that the two knowledge domains used in this experiment, verbal knowledge and causal knowledge, are simpler than those used in past research, both lack common, conventional labels. In this respect, it may be more difficult to recognize causal and verbal experts as opposed to familiar experts, such as doctors and pilots. Moreover, as was discussed, previous research established that when given a label suggestive of a domain of knowledge, such as doctor, four-and-five-year-olds identified concepts related to their expertise. In this case, however, children were not provided with a label for the informants. Rather, children were obligated to discern the relevance of the informants' actions, thereby inducing an epistemic state from observable evidence. Four-year-olds therefore demonstrated a greater level of sensitivity to the relevance and importance of knowledge domains in this study than in previous research.

Although four-year-olds responded consistently as a group to the verbal and causal questions, this consistency was not found for the functional questions. Two possible theoretical perspectives presented different predictions regarding whether children would relate functional knowledge more closely to verbal knowledge or causal knowledge. The first perspective proposed that children may prefer the verbal expert for functional questions, since both verbal and functional knowledge are types

of conventional knowledge. Contrarily, given the relation of functions to objects' causal structures, the second perspective suggested that for this reason children may prefer the causal expert. With a forced choice between a causal expert and a verbal expert, children of both ages performed no different from chance, seemingly undecided as to the best option. While this result does not offer a clear resolution as to how children relate functional knowledge to verbal and causal knowledge, a trend was found in the consistency with which children selected one of the informants for both functional questions. Three-year-olds selected the same informant for both questions at a marginally significant level, but four-year-olds did so at a much stronger level of significance. This difference is an indication that four-year-olds approached the functional questions in a different manner than the three-year-olds. Though they were not consistently making the same decision as a group, four-year-olds had firm answers to the functional questions. This result may reflect theories that the older children developed regarding which expert is best suited to answer the functional questions.

Regarding children's conceptions of functional knowledge, future research should explore possible developmental trends in how children's own knowledge of functions relates to their preferences in source monitoring research. Prior research has established that two-year-olds categorize objects based on their functions, suggesting that they consider functional knowledge to be of particular importance to the concepts of objects (Kemler, Russell, Duke, & Jones, 2000). Thus, at two years of age, children understand that functional knowledge underlies verbal knowledge in the identification of objects. At three and four years of age, as children explore the causal structures of objects through play and experimentation, they make a conceptually more prominent link; namely, that causal structures underlie functions (Schulz & Bonawitz, 2007). As regards source monitoring research, children's preferences for the causal expert or verbal expert for the functional question may correspond with their understanding of

the relation between causal structure and objects' functional outputs. Specifically, children may reference their own learning and knowledge to evaluate the suitability of the possible sources of knowledge. Therefore, future research should further explore how children's own knowledge of the relation between causal structures and functions, and, in turn, functions and labels, may relate to their preferences for either the verbal expert or the causal expert.

Lastly, it has been suggested that children's performance in this experiment reflected evaluations of the epistemic states of the two informants. Countering this perspective, it may be argued that children merely associated the informants with particular achievements, such as fixing the toys, but did not consider their mental states when responding to the prediction questions. While this is a possibility, we argue that children were using their own knowledge about words and mechanics to judge the epistemic states of the informants. In this study, there was no correspondence between the stimuli used in the demonstrations and the prediction trials. Thus, children could not have associated the informants with particular types of objects. Additionally, if children did not themselves distinguish between causal and verbal knowledge, it is difficult to conceive of why they would differentially prefer the verbal expert and causal expert when asked to choose a helper.

In conclusion, children consider a variety of information when evaluating whether to trust other people's statements. This research provides further evidence that children recognize particular kinds of expertise, in this case causal expertise and verbal expertise, when deciding whom to ask for help. While past research has focused on *whether* someone is accurate or inaccurate, these results emphasize that children pay attention to a more detailed piece of the puzzle. Generally, people are neither categorically accurate nor inaccurate. So one must consider *what* people are accurate and inaccurate about, and young children do.

APPENDIX



Photograph #1: The hand-held 20 Questions game that Squirrel and Monkey fixed with a wrench.



Photograph #2: The HSM microphone that Squirrel and Monkey fixed with a screwdriver.



Photograph #3: The tea diffuser used for one of the labeling questions.



Photograph #4: The avocado peeler used for one of the labeling questions.



Photograph #5: One of the hand-held electronic toys used for one of the causal questions.



Photograph #6: One of the hand-held toys used for one of the causal questions.



Photograph #7: The unconventional dish scrubber used for one of the functional questions.



Photograph #8: The black electronic box used for the functional questions.

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